Chapter 11

Intersection Studies

Intersection Studies

- Identification of crashes at intersections based on the specified county, dates, Y-line, and intersecting route combinations

- All route combinations must be entered

- All intersection studies are combination dependant

- Milepost information is not necessary to identify crashes at intersections

Standard Parameters

General Intersection Studies:

Date range = 3 years

Y-line = 150 feet

Fatal Intersection Studies:

Date range = 5 years

Y-line = 150 feet

(allows for broader information - especially on rural roads)

Pedestrian and/or Bicycle Intersection Studies:

Date range = 10 years

Y-line = 50 feet

(smaller subset of data; captures parallel crosswalk areas)

(can compare to HSIP safety warrants)

Standard Parameters (Cont.)

Highway Safety Improvement Program (HSIP) Intersection Studies:

Date range = 5 years

Y-line = 150 feet

(allows for a comparison with safety warrants)

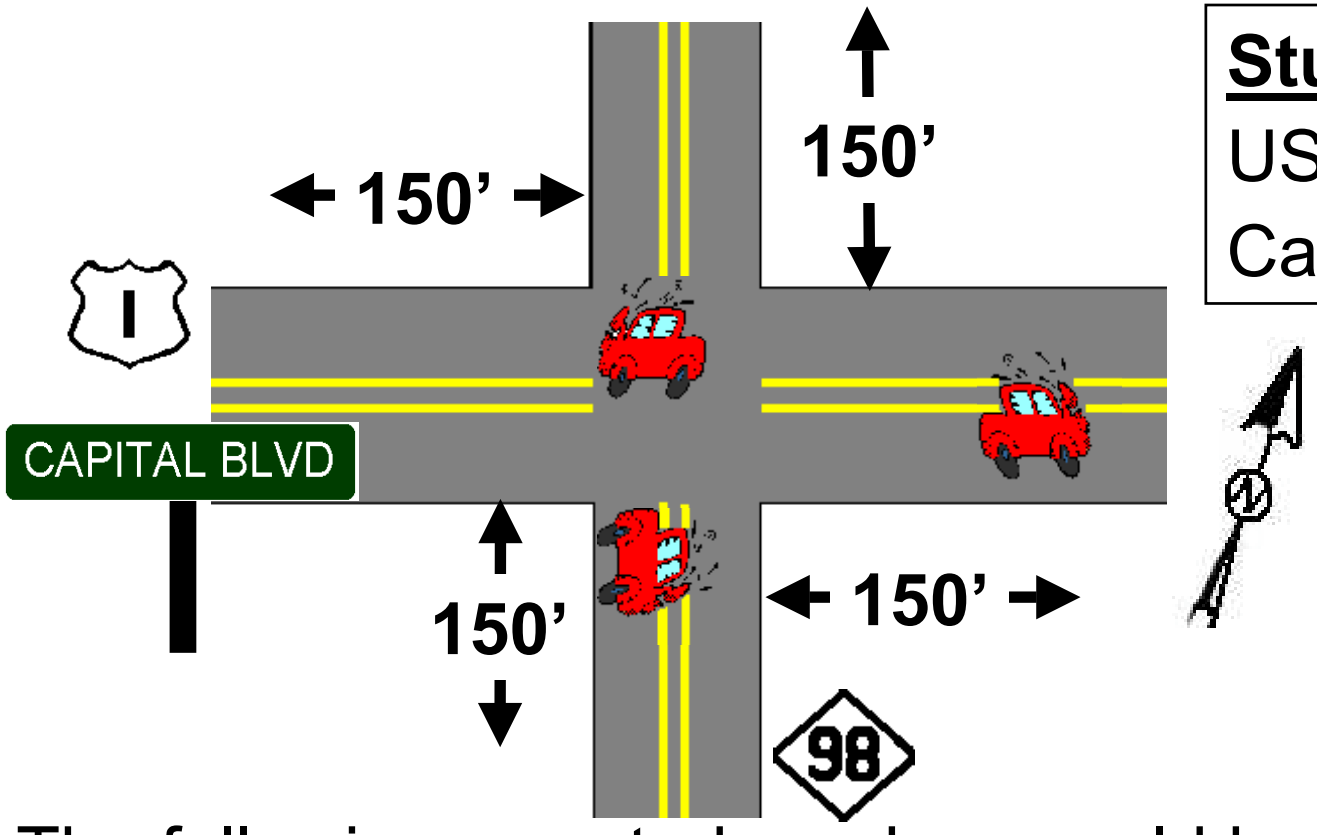
Interchange Studies:

Date range = 3 years

Y-line depends on the length of the ramps and what location is being studied (bridge, underpass, ramps, etc.)

(interchanges can be studied as two strips)

Intersections - Combination Dependant



Study Combinations

US 1 - NC 98

Capital Blvd - NC 98

The following reported crashes would be included in a study of US 1/Capital Blvd and NC 98 (150 foot Y-Line):

ON RD	FROM RD	FROM DIST	FROM DIR
Capital Blvd	NC 98	0 ft	
NC 98	US 1	10 ft	S
US 1	NC 98	150 ft	E

Intersection Identification

- Crashes at intersection locations are identified by route **COMBINATIONS** (not mileposts)!

- When performing an intersection study, it is necessary to determine all possible combinations of intersecting routes (therefore, it is important to know all of the possible names of routes).

- It is imperative to list every possible combination (no matter how unlikely).

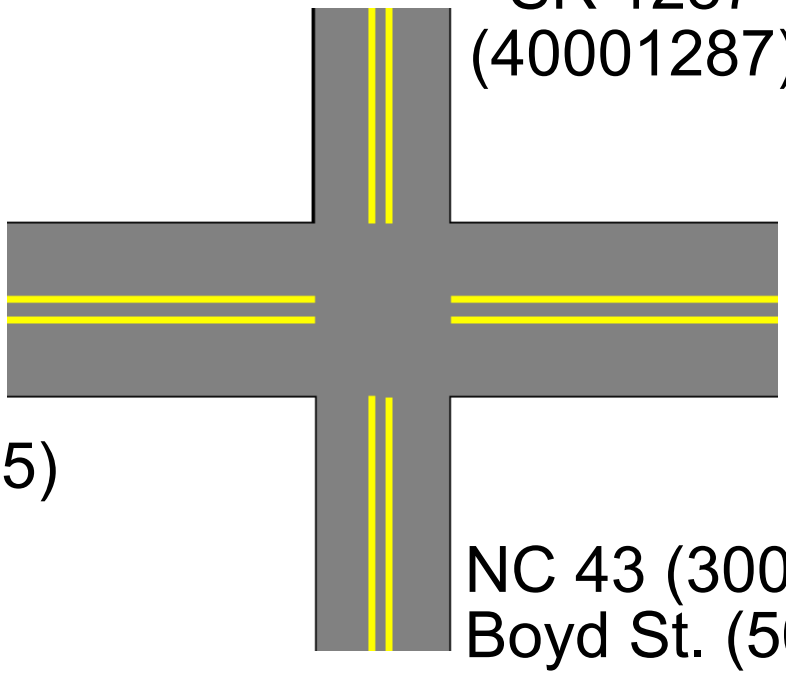
Intersection Identification (Cont.)

- Get the mileposting for your intersecting routes (and all coinciding routes).

- Crashes are identified by the route combinations!

- Beware of loop locations!

Intersection Combination Example

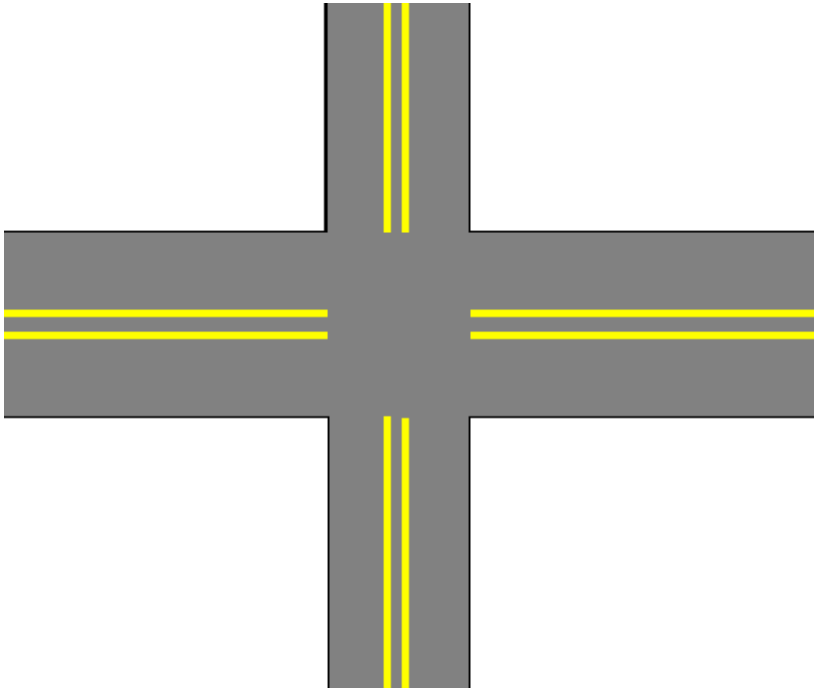


COMBINATIONS

1. 20000015 - 40001287
2. 20000015 - 30000086
3. 20000015 - 50018682
4. 20000015 - 30000043
5. 20000015 - 50003381
6. 40001287 - 30000086
7. 40001287 - 50018682
8. 40001287 - 30000043
9. 40001287 - 50003381
10. 30000086 - 30000043
11. 30000086 - 50003381
12. 50018682 - 30000043
13. 50018682 - 50003381

Intersection Combination Exercise

US 401 (20000401)



Old Wake Forest Rd
(50009210)

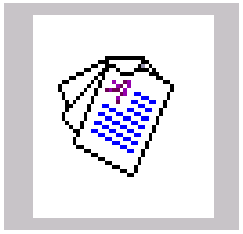
US 1 (20000001)
Capital Blvd (50004906)

COMBINATIONS

1.
2.
3.
4.
5.

Intersection Study Screen

• Access the “Intersection Analysis Report” screen by selecting the following:

 ⇒ Intersection Study Report

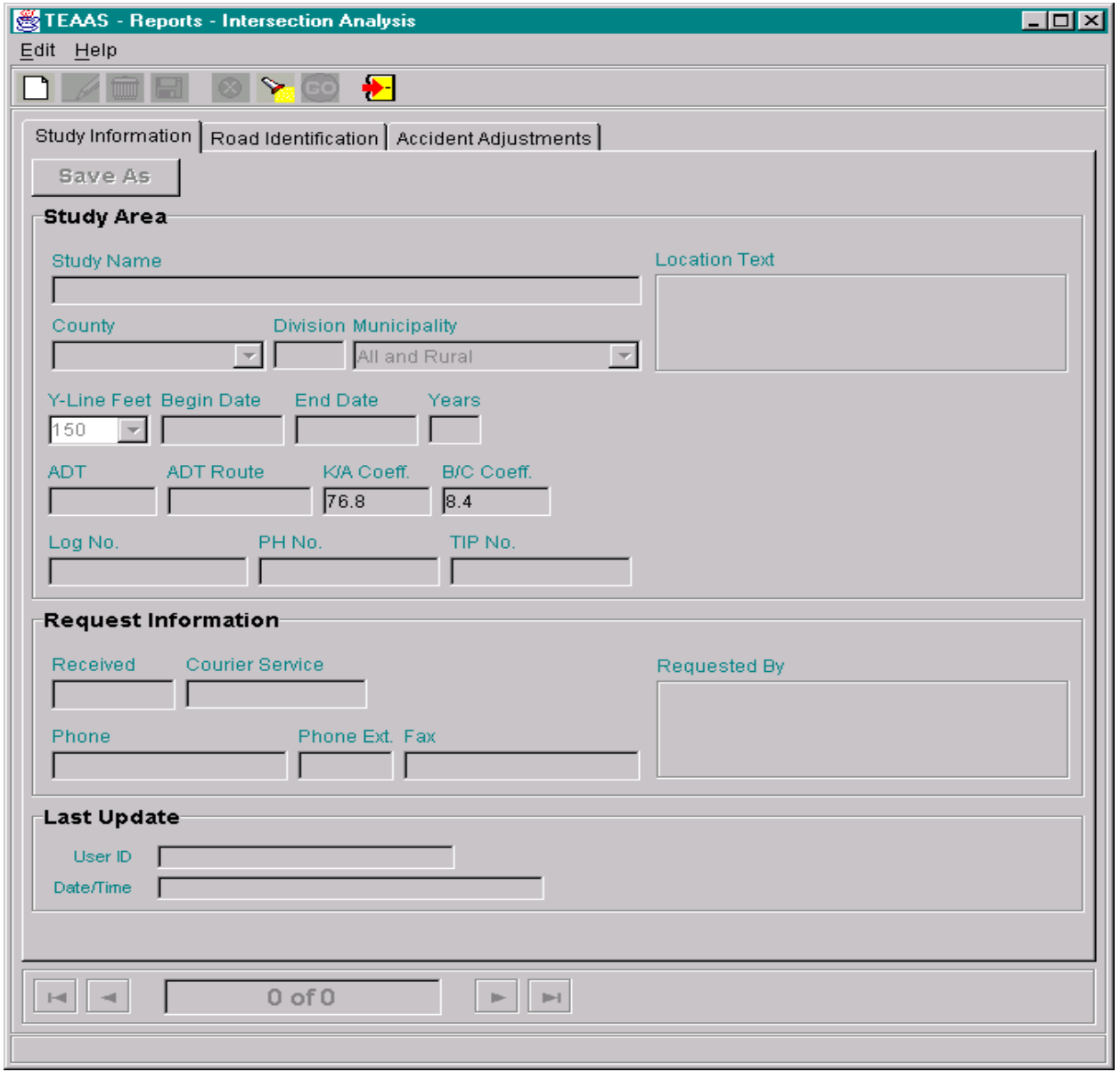
• Consists of 3 tabs within the screen:

  – **Study Information** - allows for entry of general study information

  – **Road Identification** - allows the User to specify the road combinations

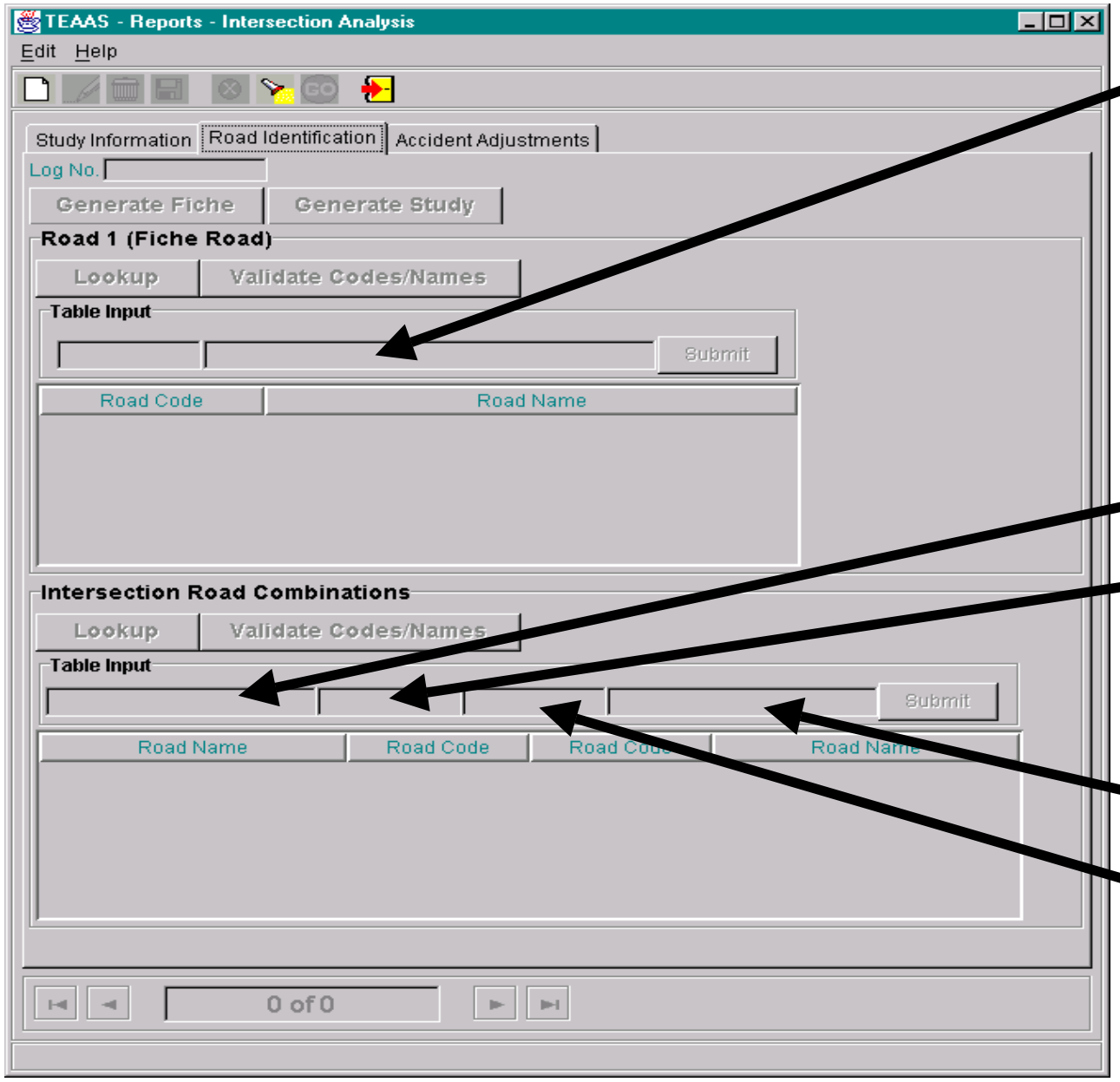
  – **Accident Adjustments** - allows the User to include or exclude crashes

Study Information Tab



See Chapter 10 for information on this screen.

Road Identification Tab



Enter the "main" route and all coinciding routes and click the **"Validate Codes/Names"** button

Road "A" name

Road "A" 8-digit code

Road "B" name

Road "B" 8-digit code

Remember - use caution when using the "Lookup" button!

Road Combinations

1. At least one road combination must be specified!

2. To enter a combination of “A” and “B”...
   - For road “A”, enter a road name of up to 25 alphanumeric characters **OR** enter a valid 8-digit code.
   - For road “B”, enter a road name of up to 25 alphanumeric characters **OR** enter a valid 8-digit code.
   - Click the **“Submit”** button
   - Repeat this process to input additional combinations

3. Click the **“Validate Codes/Names”** button to determine the 8-digit codes for entries with only road names

Road Combinations (Cont.)

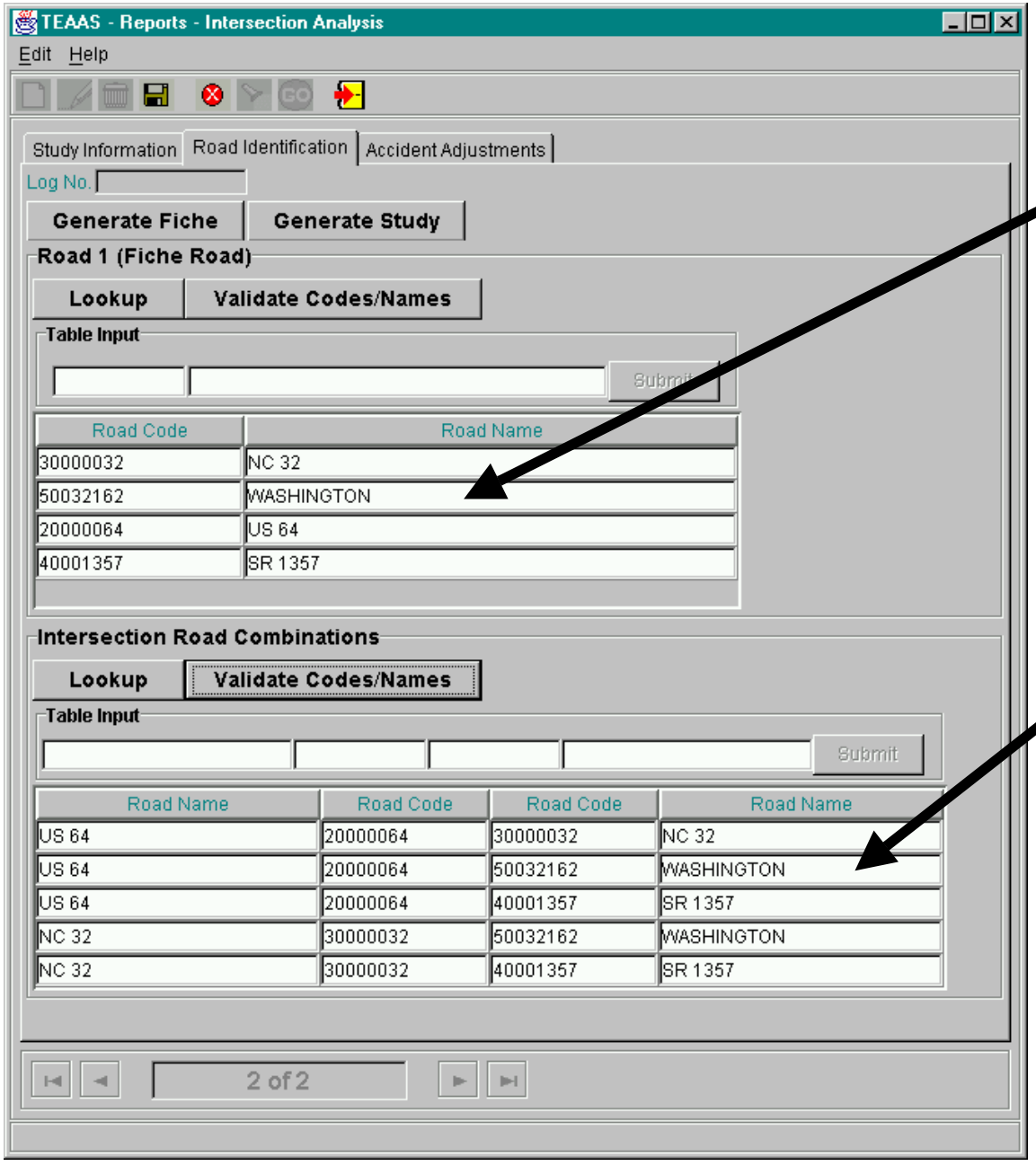
- **To delete a combination:**
  - Highlight the row
  - Click the **"Delete"** key

Remember - use caution when using the "Lookup" button!

- **To modify a combination:**
  - Highlight the row
  - Click the **"Enter"** key
  - Edit record in the input section
  - Click the **"Submit"** button

- **To identify local names for secondary roads**:
  - Click the **"Lookup"** button
  - Highlight the name of the roads you want to include
  - Click the **"Include"** button
  - Modify rows from included local names to show intersecting routes

Road Combinations Example



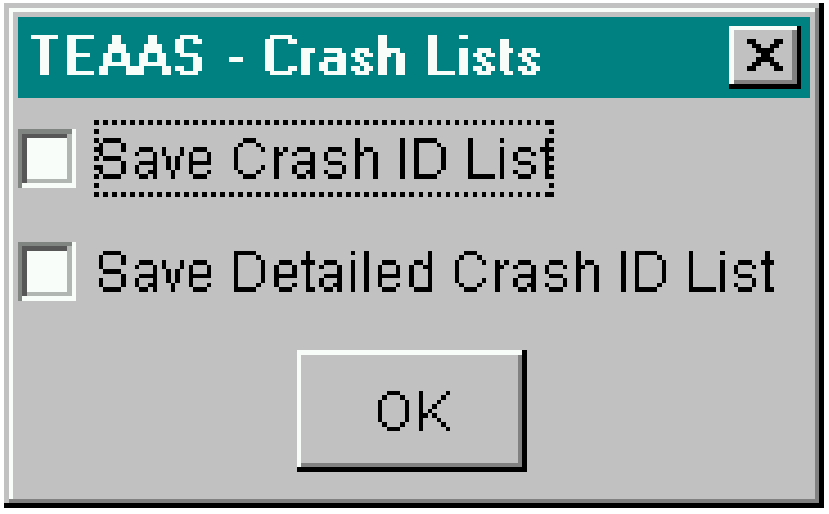
"Main" route and all coinciding routes

Combinations

Road Identification Tab (Cont.)

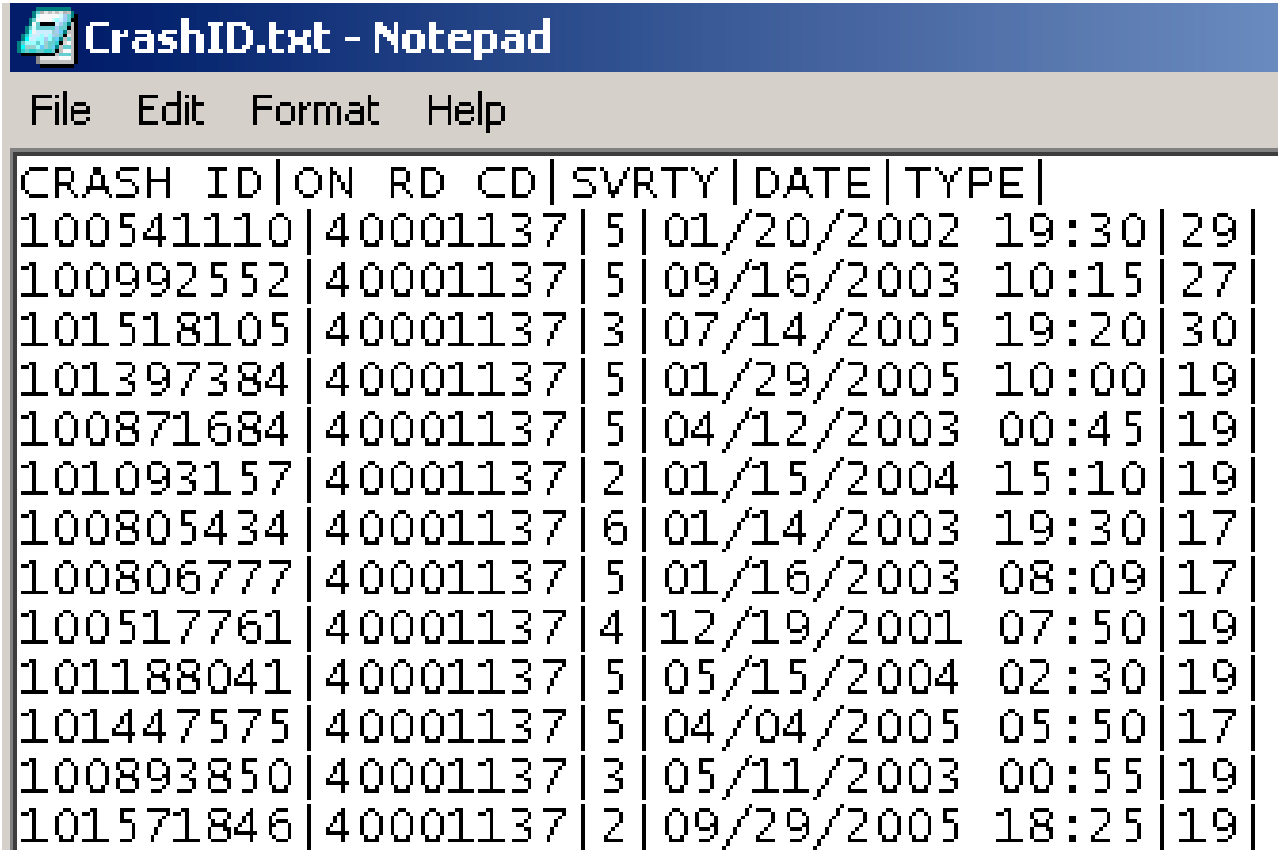
- Click on the **"Generate Study"** button to run an intersection study based on the study criteria.

- A dialog box will prompt users to save a "Crash ID List" (crash level information) or a "Detailed Crash ID List" (person level information). Select the output option (if desired) and click the **"OK"** button. If selected, this information will be saved as a text file.



Crash ID List

- This text file contains 5 columns of crash-level crash data.
- It may be imported into Excel or Access for further review.



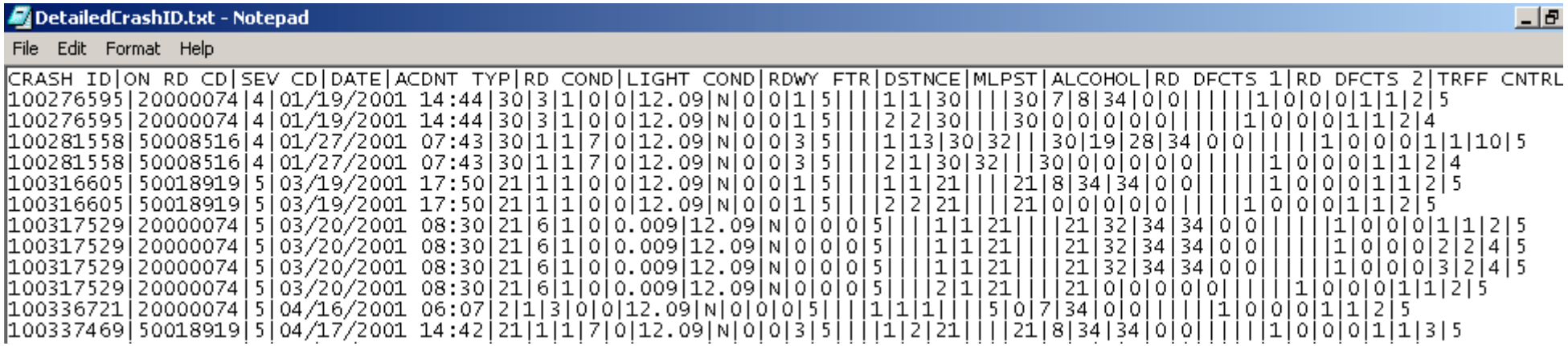
CrashID.txt - Notepad

File Edit Format Help

```
CRASH ID|ON RD CD|SVRTY|DATE|TYPE|
100541110|40001137|5|01/20/2002 19:30|29|
100992552|40001137|5|09/16/2003 10:15|27|
101518105|40001137|3|07/14/2005 19:20|30|
101397384|40001137|5|01/29/2005 10:00|19|
100871684|40001137|5|04/12/2003 00:45|19|
101093157|40001137|2|01/15/2004 15:10|19|
100805434|40001137|6|01/14/2003 19:30|17|
100806777|40001137|5|01/16/2003 08:09|17|
100517761|40001137|4|12/19/2001 07:50|19|
101188041|40001137|5|05/15/2004 02:30|19|
101447575|40001137|5|04/04/2005 05:50|17|
100893850|40001137|3|05/11/2003 00:55|19|
101571846|40001137|2|09/29/2005 18:25|19|
```

Detailed Crash ID List

- This text file contains 43 columns of person-level crash data.
- It may be imported into Excel or Access for further review.



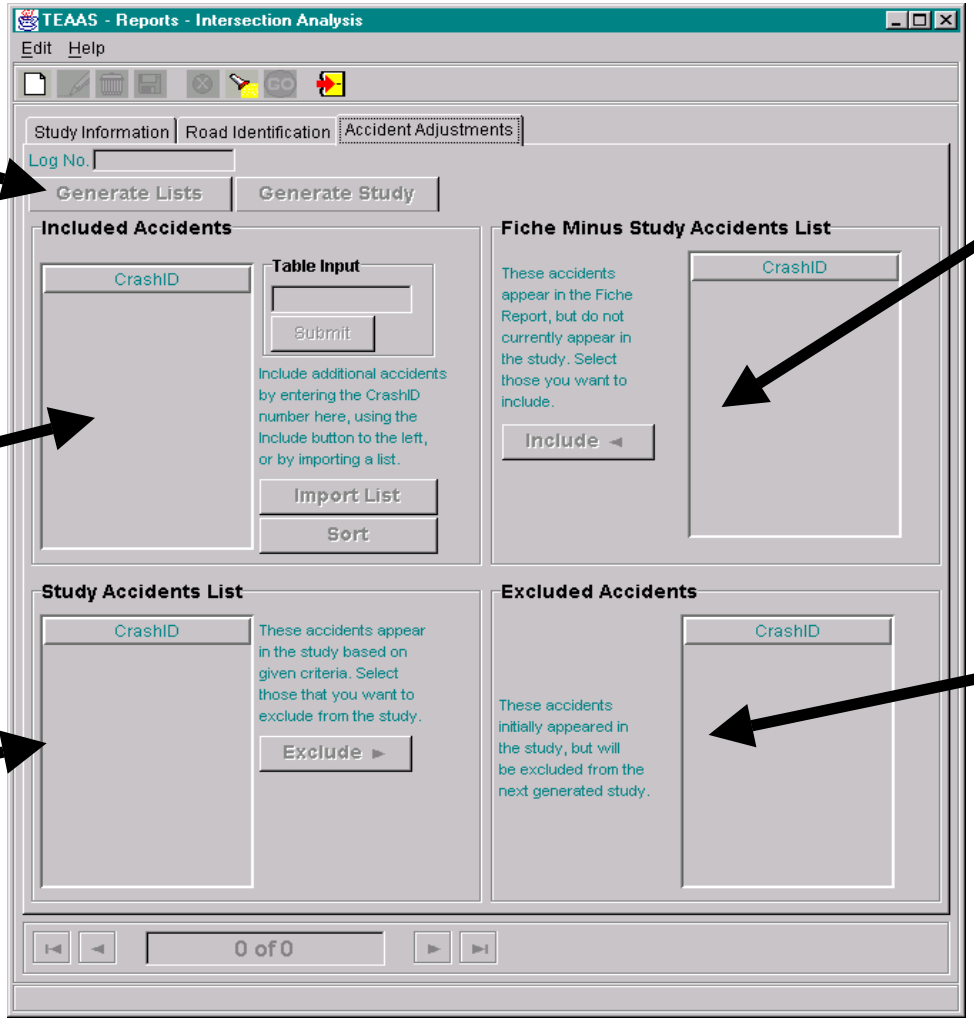
DetailedCrashID.txt - Notepad

File Edit Format Help

```
CRASH ID|ON RD CD|SEV CD|DATE|ACDNT TYP|RD COND|LIGHT COND|RDWY FTR|DSTNCE|MLPST|ALCOHOL|RD DFCTS 1|RD DFCTS 2|TRFF CNTRL
100276595|20000074|4|01/19/2001 14:44|30|3|1|0|0|12.09|N|0|0|1|5||||1|1|30||||30|7|8|34|0|0||||||1|0|0|0|1|1|2|5
100276595|20000074|4|01/19/2001 14:44|30|3|1|0|0|12.09|N|0|0|1|5||||2|2|30||||30|0|0|0|0|0||||||1|0|0|0|1|1|2|4
100281558|50008516|4|01/27/2001 07:43|30|1|1|7|0|12.09|N|0|0|3|5||||1|13|30|32|||30|19|28|34|0|0|||||1|0|0|0|1|1|10|5
100281558|50008516|4|01/27/2001 07:43|30|1|1|7|0|12.09|N|0|0|3|5||||2|1|30|32|||30|0|0|0|0|0|||||1|0|0|0|1|1|2|4
100316605|50018919|5|03/19/2001 17:50|21|1|1|0|0|12.09|N|0|0|1|5||||1|1|21||||21|8|34|34|0|0|||||1|0|0|0|1|1|2|5
100316605|50018919|5|03/19/2001 17:50|21|1|1|0|0|12.09|N|0|0|1|5||||2|2|21||||21|0|0|0|0|0|||||1|0|0|0|1|1|2|5
100317529|20000074|5|03/20/2001 08:30|21|6|1|0|0.009|12.09|N|0|0|0|5||||1|1|21||||21|32|34|34|0|0|||||1|0|0|0|1|1|2|5
100317529|20000074|5|03/20/2001 08:30|21|6|1|0|0.009|12.09|N|0|0|0|5||||1|1|21||||21|32|34|34|0|0|||||1|0|0|0|2|2|4|5
100317529|20000074|5|03/20/2001 08:30|21|6|1|0|0.009|12.09|N|0|0|0|5||||1|1|21||||21|32|34|34|0|0|||||1|0|0|0|3|2|4|5
100317529|20000074|5|03/20/2001 08:30|21|6|1|0|0.009|12.09|N|0|0|0|5||||2|1|21||||21|0|0|0|0|0|||||1|0|0|0|1|1|2|5
100336721|20000074|5|04/16/2001 06:07|2|1|3|0|0|12.09|N|0|0|0|5||||1|1|1||||5|0|7|34|0|0|||||1|0|0|0|1|1|2|5
100337469|50018919|5|04/17/2001 14:42|21|1|1|7|0|12.09|N|0|0|3|5||||1|2|21||||21|8|34|34|0|0|||||1|0|0|0|1|1|3|5
```

Accident Adjustments Tab

- Allows users to edit (add or delete) crashes.
- Click the **"Generate Lists"** button to populate the data.



"**Generate Lists**" button

"Included Accidents" table

"Study Accidents List" table

"Fiche Minus Study Accidents List" table

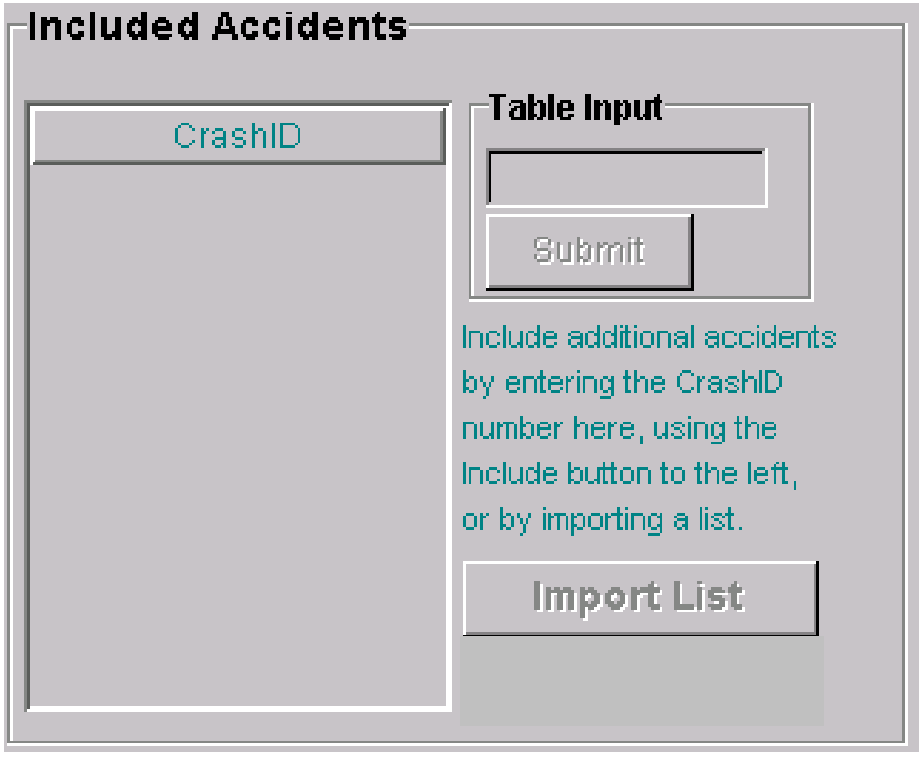
"Excluded Accidents" table

Included Accidents

Crashes added to the study by:

1) Including crashes from the "Fiche Minus Study Accidents" table

2) Entering a Crash ID into the "Table Input" section and clicking the **"Submit"** button



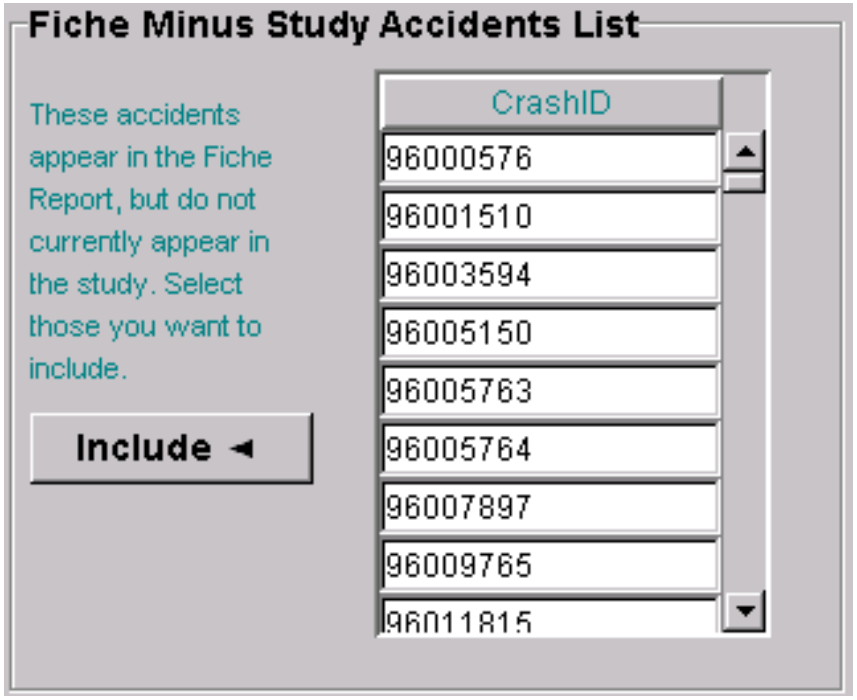
3) Clicking the **"Import List"** button to import a text file containing Crash IDs

To remove crashes from this table:

Highlight the Crash ID and click the **"Delete"** key (multiple records may be highlighted using the **"Ctrl"** or **"Shift"** keys)

Fiche Minus Study Accidents List

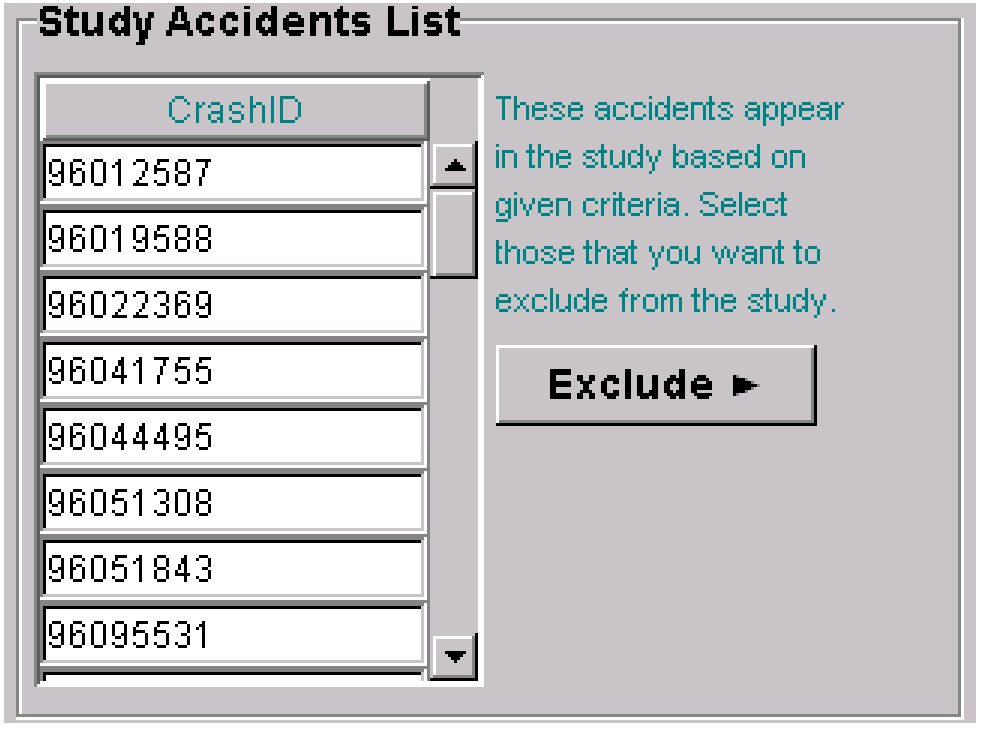
- Crashes appearing in this table are contained within the fiche report but have not been included in the study.



- To include crashes from this table into study:
  - Highlight the Crash ID
  - Click the **"Include"** button
  - Highlight multiple records using the **"Ctrl"** or **"Shift"** keys.

Study Accidents List

- Crashes appearing in this table are in the study but may or may not be on the fiche report.

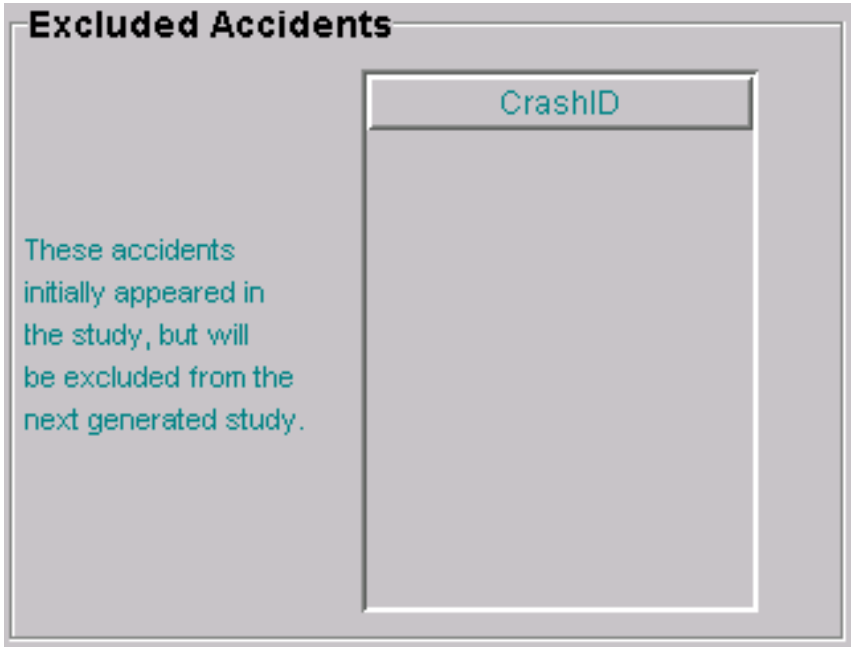


- To exclude crashes from the study:
  - Highlight the Crash ID and click the **"Exclude"** button
  - Highlight multiple records with the **"Ctrl"** or **"Shift"** keys

(Excluded crashes are moved to the "Excluded Accidents" table.)

Excluded Accidents

- Can only be populated by excluding crashes from the “Study Accidents List” table



- To delete crashes from this panel
  - Highlight the Crash ID
  - Click the **“Delete”** key
  - Highlight multiple records using the **“Ctrl”** or **“Shift”** keys

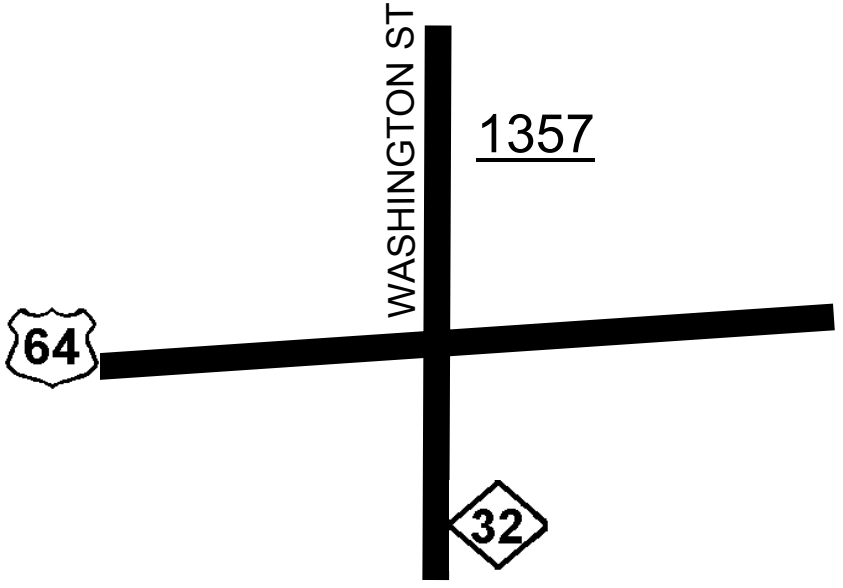
Intersection Studies - Steps

1) Determine the location and reason for the study
    - Review maps
    - Run feature report(s)
    - Determine all Intersection Combinations
    - Determine or calculate traffic volumes (AADTs)
2) Enter study criteria
3) Generate a fiche report
4) Generate the initial study
5) Evaluate the fiche report and compare it with the initial study to determine if any crashes need to be added or deleted
6) Add or delete crashes on the study in the “Accident Adjustments” tab
7) Generate the final study

Intersection Study Example

Suppose you perform an intersection study on the intersection of US 64 at NC 32 in Washington County from 1/1/1996 through 12/31/1999 with a Y-Line of 150 feet.

Step A - Review maps (county, city, traffic volumes, etc.)
Step B - Run features report(s)



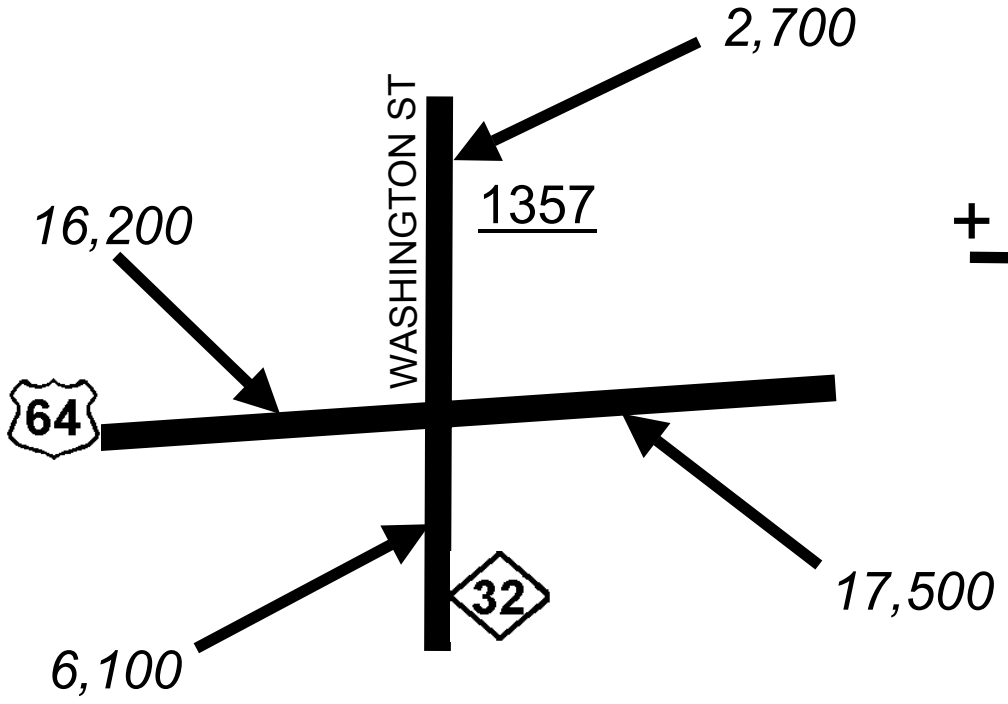
Hint: after reviewing maps and other information it was determined that the northern leg of the US 64/NC 32 intersection is SR 1357 (Washington Street). Therefore, these two additional roads must be considered when the intersection combinations are developed.

Intersection Study Example (Cont.)

Step C - Determine the intersection combinations

US 64 - WASHINGTON
US 64 - SR 1357
US 64 - NC 32
NC 32 - WASHINGTON
NC 32 - SR 1357

Step D - Calculate the AADT



$$\begin{array}{r} 16{,}200 \\ 2{,}700 \\ 17{,}500 \\ +\ \ 6{,}100 \\ \hline 42{,}500 \end{array}$$

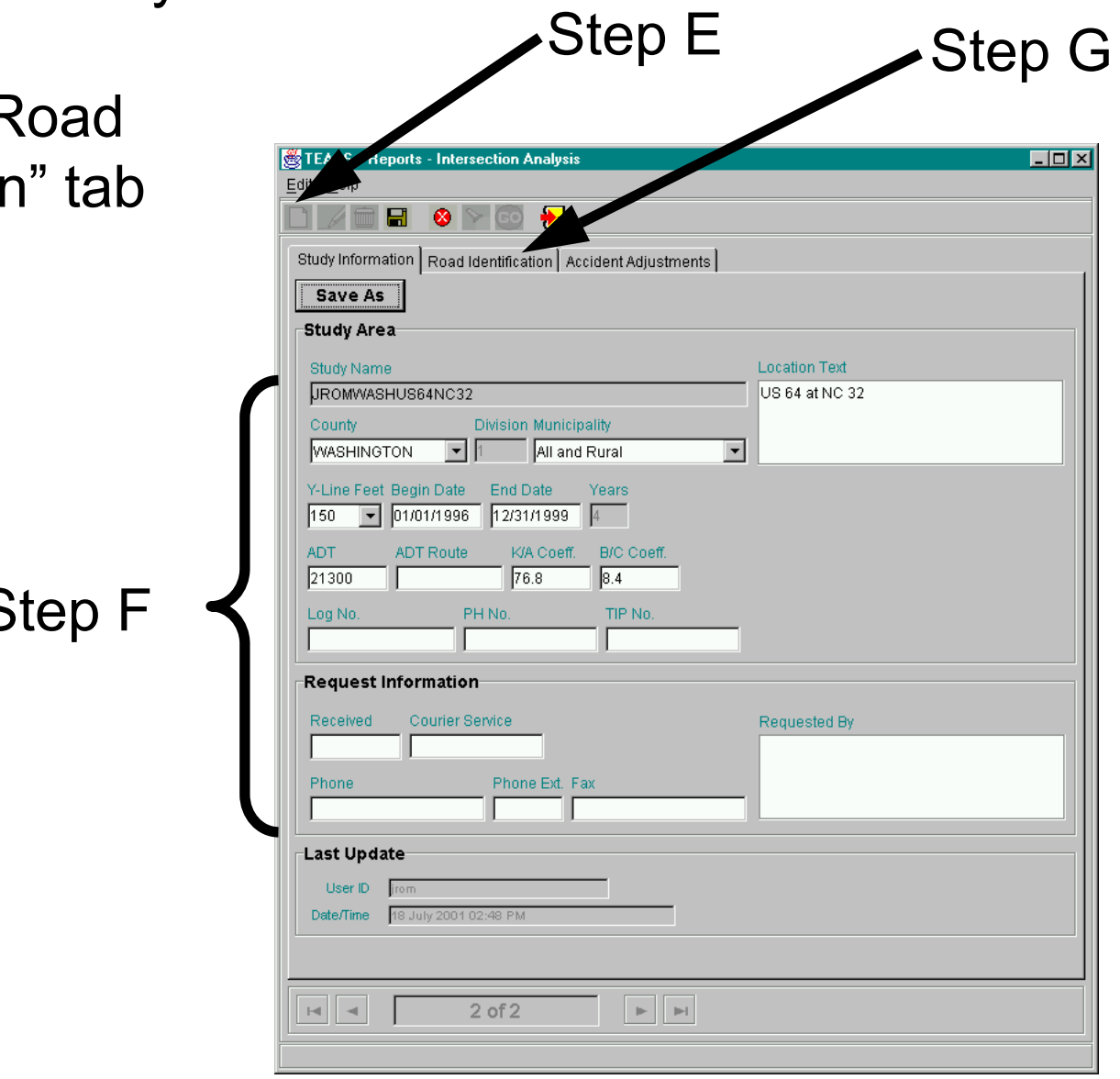
$$\frac{42{,}500}{2} = 21{,}250 \approx 21{,}300$$

Intersection Study Example (Cont.)

Step E - Click on the **"New"** icon

Step F - Enter known study information

Step G - Go to the "Road Identification" tab



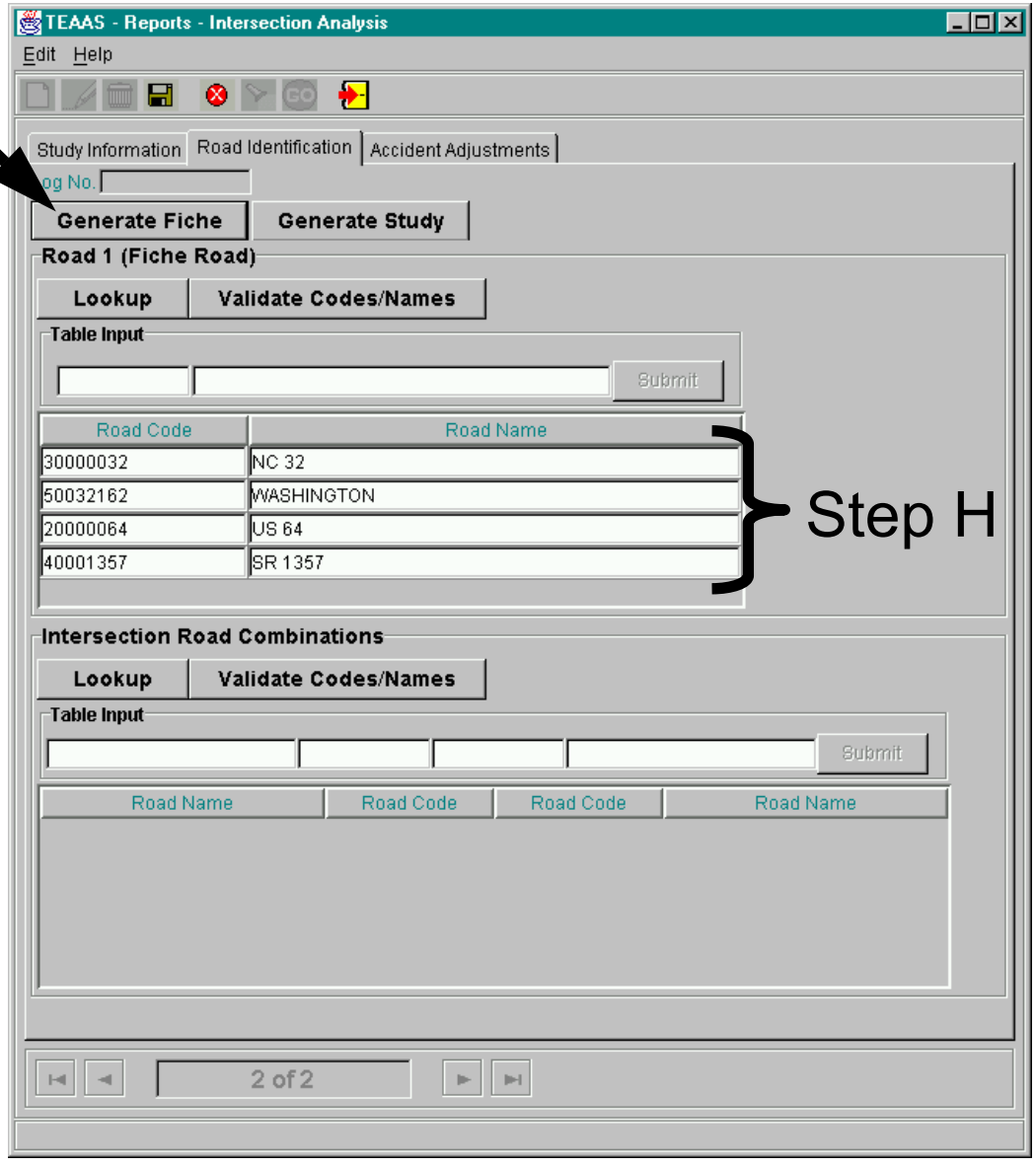
Intersection Study Example (Cont.)

Step I

Step H - Enter the fiche roads

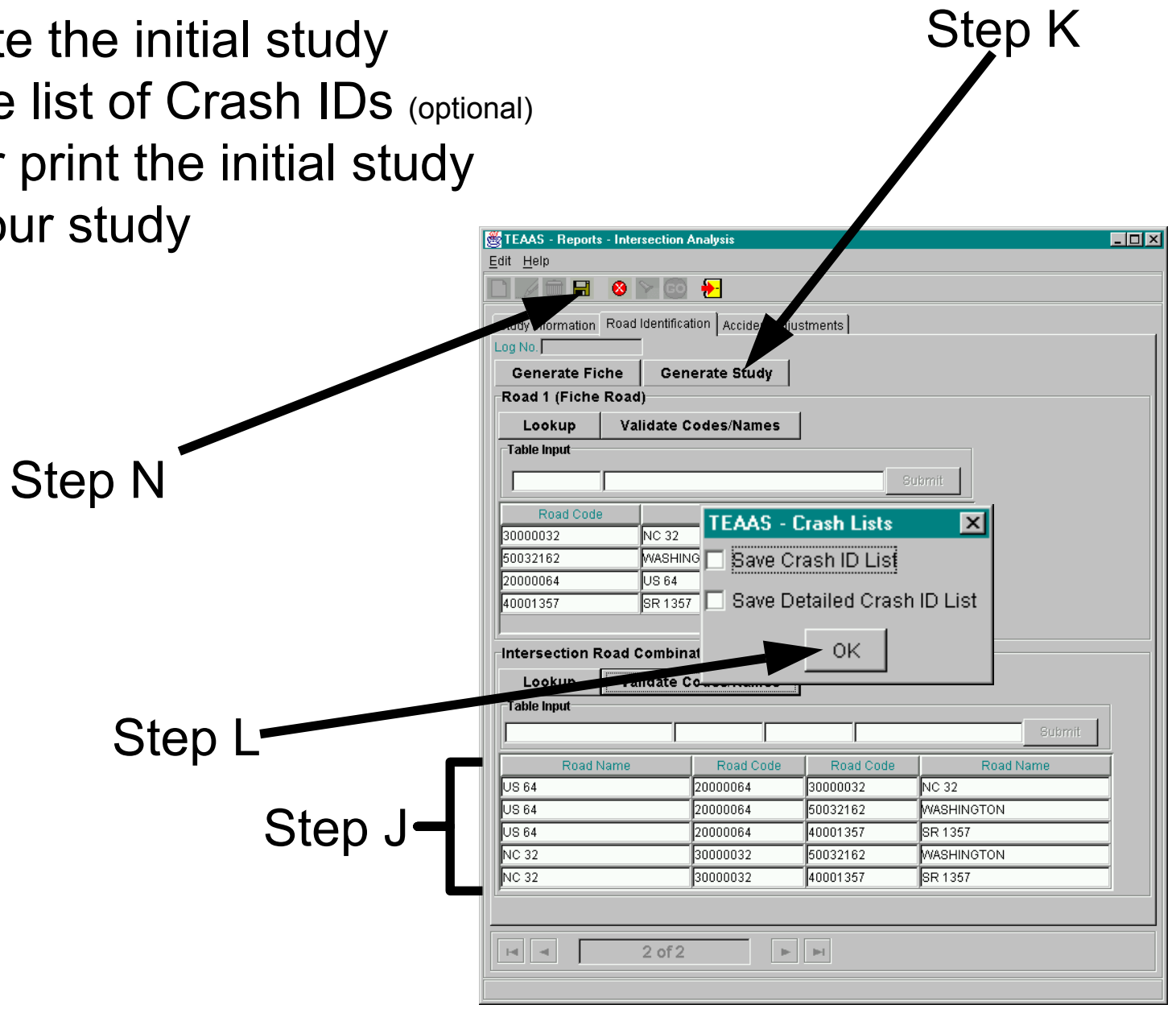
(All the roads that you want to look for crashes on)

Step I - Generate and save the fiche report



Intersection Study Example (Cont.)

Step J - Enter all the road combinations
Step K - Generate the initial study
Step L - Save the list of Crash IDs (optional)
Step M - Save or print the initial study
Step N - Save your study



Intersection Study Example (Cont.)

Step O - Compare the initial study with the fiche report to identify any crashes that need to be added or deleted. Individual crashes may need to be reviewed to make a more accurate decision.

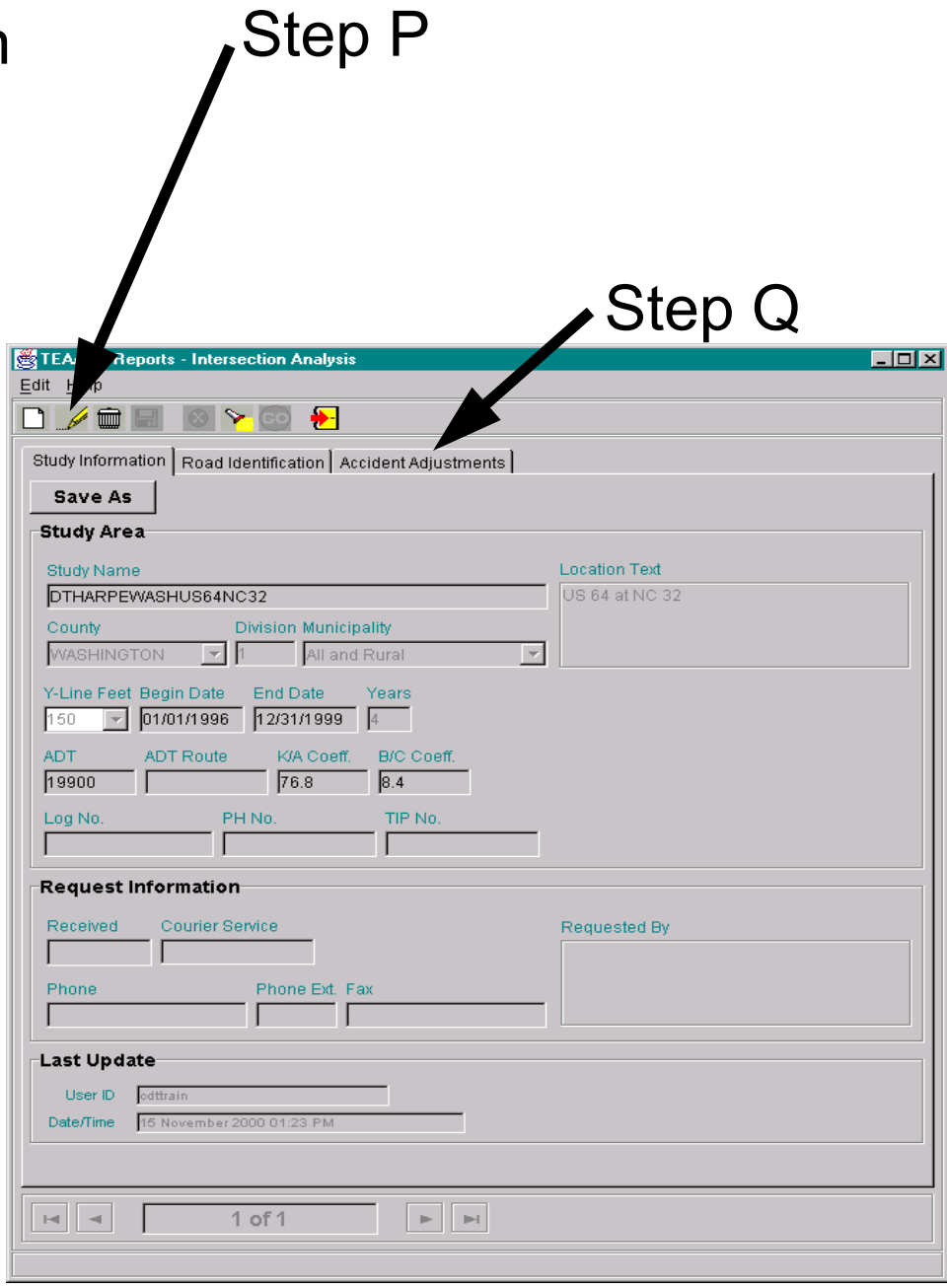
Crashes to be added	**Crashes to be deleted**
97068719	96095531
99106308	98044473
	98122774
	98244134
	99024746
	99113754

Note - this step may actually take a considerable amount of time depending on the number of identified crashes. For training purposes, only the results of this step are shown.

Intersection Study Example (Cont.)

Step P - Click on the **"Modify"** icon

Step Q - Go to the "Accident Adjustments" tab



Intersection Study Example (Cont.)

Step R - Click the **"Generate Lists"** button

Step S - Highlight the crashes to be added in the "Fiche Minus Study Accidents List" then click the **"Include"** button

Step T - Highlight the crashes to be deleted in the "Study Accidents List" then click the **"Exclude"** button

Step U - Click the **"Generate Study"** button to run the final study